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HOUSE COMMITTEE PRINT NO. 9

PROJECTS IN HAWAII, CALIFORNIA, AND ILLINOIS

REPORT

OF THE

COMMITTEE TO INSPECT PUBLIC WORKS PROJECTS AND HIGHWAYS IN HAWAII, CALIFORNIA, AND ILLINOIS

TO THE

COMMITTEE ON PUBLIC WORKS
HOUSE OF REPRESENTATIVES

HAWAII—NOVEMBER 9 TO 19, 1957
ILLINOIS ROAD TEST—OCTOBER 18–19, 1957
CALIFORNIA—OCTOBER 23 TO NOVEMBER 2, 1957

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LETTER OF TRANSMITTAL

The Honorable CHARLES A. BUCKLEY,
Chairman, Committee on Public Works,
House Office Building, Washington, D. C.

MY DEAR CHAIRMAN: I transmit herewith a report on the inspection of projects made by members of the Committee on Public Works at various points in the United States, including five of the Hawaiian Islands.

The inspection delegation included the following members of the committee:

Frank E. Smith, of Mississippi.
John C. Kluczynski, of Illinois.
W. R. Hull, Jr., of Missouri.
Kenneth J. Gray, of Illinois.
John J. McFall, of California.
J. Harry McGregor, of Ohio.
Russell V. Mack, of Washington.
Hubert B. Scudder, of California.
John F. Baldwin, of California.
Emmet F. Byrne, of Illinois.
Edwin B. Dooley, of New York.

Some members participated in all of the trip, while others were present at various points. Some were present for the inspection of the Illinois road test, some for all or part of the California phase of the trip, and others continued on to Hawaii.

You will note that several hearings were held in Hawaii and in each instance local people were given an opportunity to present their views regarding the projects under consideration. The proceedings of these hearings have been prepared for publication. The schedule of hearings was as follows:

Honolulu, Oahu, November 11 and 12, 1957
Hilo, Hawaii, November 13, 1957
Wailuku, Maui, November 15, 1957
Lihue, Kauai, November 18, 1957

It is suggested that this report be published as a committee document and I urge your concurrence in this proposal.

Very sincerely,

JOHN C. KLUCZYNSKI, M. C.,
Chairman, Inspection Committee.

PROJECTS IN HAWAII

INSPECTION OF PROJECTS IN HAWAII

After inspection of the progress of work on the Illinois road test, the highway program in California, and various public-works projects in that State, the members of the Committee on Public Works participating in the inspection of projects embarked on the steamship *Matsonia* for Hawaii, arriving in Honolulu, Oahu, on November 9, 1957. On the following Monday morning, November 11, the committee engaged in a substantial schedule of inspections and formal hearings on the islands of Oahu, Hawaii, Maui, Molokai, and Kauai. This schedule of inspections included—

(1) Harbor projects in Oahu (Honolulu), Hawaii, Molokai, Maui, and Kauai.

(2) Flood-control projects in Oahu (Kawainui Swamp), Hawaii (Wailoa River), Maui (Iao stream), and Kauai (Waimea and Hannapepe Rivers.)

(3) Beach protection and improvement in Oahu (Waikiki Beach).

(4) Public buildings projects in Oahu and Maui (Honolulu and Wailuku).

(5) Highways in Oahu, Hawaii, Maui, Molokai and Kauai.

Hearings were held as follows:

Honolulu, Oahu, November 11 and 12.
Hilo, Hawaii, November 13.
Wailuku, Maui, November 15.
Lihue, Kauai, November 18.

The Hawaiian Islands group consists of eight islands, as follows (west to east):

Niihau, the Island of Yesteryear, is the private property of one family, the Robinsons.

Kauai, the Garden Island; county seat, Lihue.

Oahu, the Capitol Island; Honolulu.

Molokai, the Friendly Island; Leper Colony at Kalaupapa.

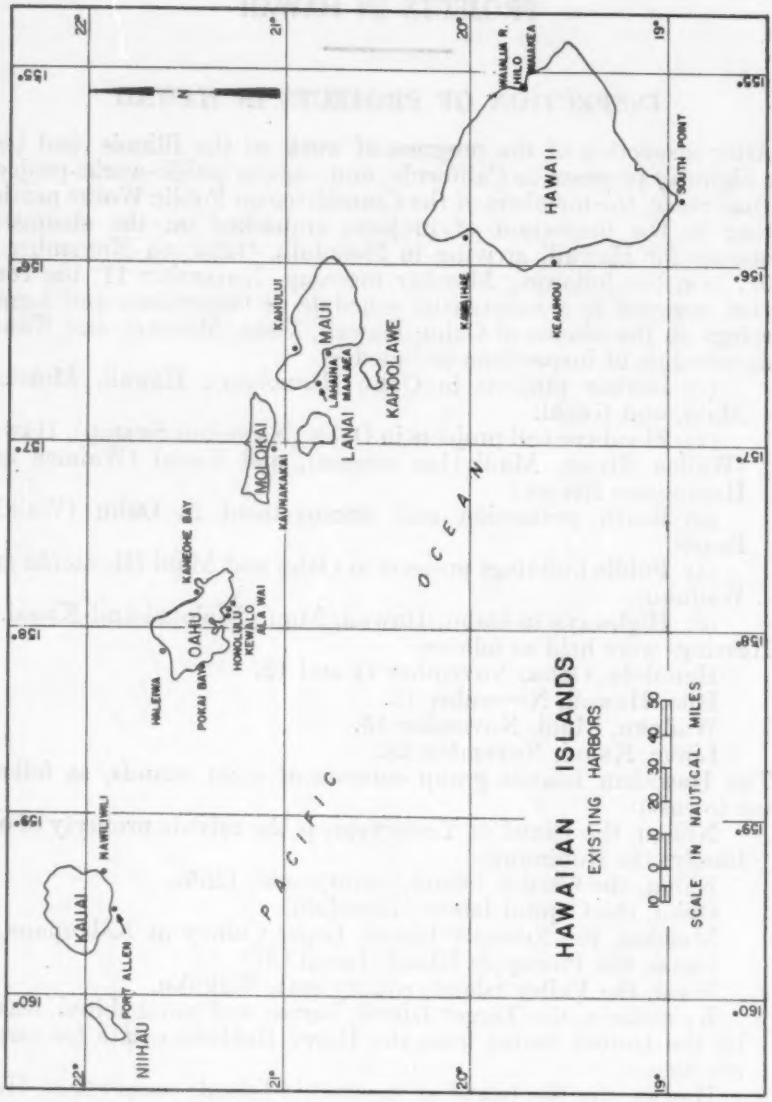
Lanai, the Pineapple Island; Lanai City.

Maui, the Valley Island; county seat, Wailuku.

Kahoolawe, the Target Island; barren and uninhabited, leased by the United States from the Harry Baldwin estate for target practice.

Hawaii, the Big Island or the Orchid Island; county seat, Hilo.

The group includes a number of smaller islands, among them Kaula, Lehua, Molokini, Nihoa, Necker, and others.


HAWAIIAN ISLANDS
EXISTING HARBORS
SCALE IN NAUTICAL MILES
10 0 10 20 30 40 50
KAUAI
NAWILIWILI
PORT ALLEN
NIIHAU
OAHU
HALEIWA
KANEOHE BAY
POKAI BAY
HONOLULU
KEWALO
ALA WAI
MOLOKAI
KAUNAKAKAI
KAHULUI
MAUI
LAHAINA
HAALEA
LANAI
KAHOOLAWE
KIHULHAE
KEAUHOU
HAWAII
WAIALUA R.
HILO
HAMAKEA
SOUTH POINT
PACIFIC OCEAN
N
22°
21°
20°
19°
155°
156°
157°
158°
159°
160°

Harbor and Navigation Projects

In keeping with the established policy of the Committee on Public Works, inspections were made of authorized projects, to ascertain the progress of the work, and proposed projects, to determine from first-hand observance the desirability of studying and undertaking the proposed works. The following paragraphs constitute committee comments on the projects considered and inspected.

HONOLULU HARBOR, OAHU

The existing project provides for an entrance channel 40 feet deep, 500 feet wide, and 4,000 feet long; an outer harbor basin 35 feet deep, about 1,520 feet wide, and 3,300 feet long, a channel connecting the outer harbor basin with Kapalama Basin, 35 feet deep, 1,000 feet wide through the first 1,000 feet, thence 600 feet wide for the remaining 2,400 feet; an inner harbor basin (Kapalama Basin) 35 feet deep, about 1,000 feet wide and 3,400 feet long; a slip on the easterly side of pier 39, 35 feet deep and 1,000 feet long. The above portion of the project is complete.

Honolulu is the principal port of the Hawaiian Islands, and the only deep-water port on the island of Oahu, except for the Pearl Harbor Naval Base, which was inspected by the committee on Sunday, November 10. Trans-Pacific imports for 1956 totaled 2,151,788 tons; interisland imports totaled 526,939 tons. Exports for the same year amounted to: Trans-Pacific 794,864 tons; interisland 310,594 tons. Federal cost of the project to date is $4,627,544, of which $675,181 has been for maintenance.

SECOND CHANNEL

Local interests placed top proprity on construction of the second entrance to Honolulu Harbor, authorized by the River and Harbor Act of 1954 (81st Cong.). The committee was advised that due to the limited access to Honolulu Harbor, an accident such as a stranding or sinking at the harbor entrance would completely block the entrance and make the harbor unavailable for commercial or military vessels. Further action on the second entrance is dependent upon appropriations.

Deepening of Honolulu Harbor was stressed by local interests both in the hearings and during the harbor inspection trip.

BARBERS POINT PROPOSAL

Representatives of local interests strongly urged development of a harbor, approximating the size of Kawaihoe Harbor, Island of Hawaii, at Barbers Point, Oahu. The provision of such a harbor, it was pointed out, would take much pressure off of the present Honolulu Harbor.

A statement setting forth the details of the Barbers Point proposal will be found in the Public Works Projects of Hawaii hearings.

Inspection of Honolulu Harbor by boat indicated to the committee that the harbor was handling a substantial volume of commerce and hence utilizing its facilities to near capacity. Dependence upon Honolulu Harbor for supporting the numerous military installations on the island of Oahu with supplies convinced the committee of

the urgency of maintaining and improving the harbor to meet present and prospective shipping needs.

ANCHORAGE AREAS, HONOLULU

Ships entering the Honolulu Harbor carrying more than 500 pounds of class A explosives were prohibited effective June 1957. A study will be made to determine the most feasible and economical allowable method of unloading for ships bringing explosives to the Hawaiian Islands.

FURTHER HONOLULU HARBOR STUDIES

The present depth of the Honolulu Harbor is 35 feet, which is insufficient to accommodate many of the larger cargo and passenger carrying vessels which are in operation at present. As the trend appears to be toward building larger vessels, the harbor will soon become inadequate. Studies for the feasibility and economic justification for deepening the Honolulu Harbor and entrance channel have been authorized. The report of survey scope is estimated to cost $28,000 and will be initiated when funds are made available.

KEEHI LAGOON, OAHU

The existing seaplane base provides for 3 intersecting runways, each 1,000 feet wide, 10 feet deep, and with lengths of 2.9, 3, and 2.25 miles, respectively; 2 stone breakwaters, one 2,500 feet long, the other 2,000 feet long at the seaward ends of the runways; the installation of a standard seaplane lighting system; a mooring basin 400 feet wide, 10 feet deep, and 800 feet long adjacent to the Honolulu Airport. As a wartime measure, this basin was enlarged to 500 feet wide and 3,000 feet long.

The runways were completed in 1944 and have been in use since that time. Construction of the breakwaters was deferred, and it now appears that they will not be required because operation of the project to date has not been seriously hampered without them. The total Federal cost to date for new work is $3,624,674, and for maintenance is $41,857. The location of this base is shown on the Honolulu Harbor project map.

HILO HARBOR, HAWAII

The existing project provides for a rubble-mound breakwater on the north side of Kuhio Bay, 10,170 feet long; an entrance to Kuhio Bay 35 feet deep; and a harbor basin 1,400 feet wide, 35 feet deep, and 2,300 feet long. The authorized project was completed in 1930. Hilo Harbor is, at present, the only deep-water port on the island of Hawaii. Hilo Harbor was severely damaged by the 1946 tidal wave and substantial repairs to the breakwater were necessary.

Mainland and foreign imports to Hilo in 1956 totaled 260,500 tons; interisland imports, 87,000 tons. Mainland and foreign exports for the same year were 515,000 tons; interisland exports, 46,500 tons.

Federal cost of the project to date has been $5,140,499, of which $1,731,673 has been for maintenance.

HILO SEAWALL, HAWAII

The city of Hilo has suffered more severely than any other locality in the Hawaiian Islands from tidal waves; that of 1946 did an estimated damage of $17 million in the Hilo area.

A plan of protection is nearing completion which appears to be feasible and economically justified. The plan provides for the construction of a cyclopean masonry wall to elevation +22 and 7,800 feet long from the Wailuku River to the Liliuokalani Park area, with a gate structure at the Wailoa River. The estimated Federal cost is $4,774,000, and annual benefits are estimated to be over $350,000.

The committee inspected the Hilo Harbor and seawall projects on Wednesday, November 13.

KAWAIHAE HARBOR, HAWAII

The approved project provides for an entrance channel 400 feet wide, 40 feet deep, and approximately 2,900 feet long; a harbor basin 1,250 feet square and 35 feet deep; and a protective breakwater on the south side of the harbor approximately 4,400 feet long, of which 3,200 feet would be protected with heavy stone revetment.

The first phase, the construction of the dike, causeways, and revetment is completed. A contract for the second phase, the dredging of the entrance channel and harbor basin, has been awarded. The third phase of the project, the construction of the breakwater, is in the advance planning stage, and construction is scheduled to start about March 1958.

Kawaihae Harbor will provide shipping facilities for the south and west side of the island of Hawaii, thus eliminating the necessity for trucking to Hilo, the only other deep-water port on the island, some 80 miles distance.

Total Federal cost to date is $695,342, all of which has been for new work. The project is scheduled for completion in 1960 at a total estimated cost of about $5,500,000, which is about $1 million below the estimated cost.

WAILOA RIVER, HAWAII

The tidal wave of March 9, 1957, deposited considerable debris and obstructions in the Wailoa River in the reach below Waiakea Pond. Local interests requested Federal assistance in restoring the navigability of the river to its original condition. A snagging and clearing project has been authorized as an emergency measure, and is scheduled to get underway during the early part of 1958. Estimated cost of the project is $48,800.

LAVA BARRIER STUDY, HILO, HAWAII

A previous report which proposed the construction of an earth and rock dike to divert possible flows of lava away from the city and harbor of Hilo was considered unfavorable. A review of the report has been authorized and will consider the possible location for dikes to be constructed in the event the flows actually occur, and will be initiated when funds are made available.

The night of November 13, at Volcano House, officials of the Hawaii National Park showed to the members of the committee motion

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pictures of recent volcano eruptions on the island of Hawaii, and the members were advised concerning the problems involved when extensive eruptions are experienced. Later, the next day, the members traveled many miles through lava flows that extended into the sea.

HILO HARBOR STUDY, HAWAII

Studies have been authorized for resolving the surge problems, modification of the breakwater, facilities for small-boat anchorages, and modification of existing project lines in the Hilo Harbor area. A model study will probably be required to determine the most satisfactory and economical solution for the surge problem and modification of the breakwater. These studies may be made concurrently with those made for the determination of the effect that the proposed Hilo seawall would have on the unprotected portion of the bay area around the piers and Reeds Bay. The estimated cost of the studies is $96,000, of which $65,000 would be for the model studies.

KAHULUI HARBOR, MAUI

The existing project provided for the extension of the privately constructed rubble-mound breakwater on the east side of Kahului Harbor to a total length of 2,850 feet; a rubble-mound breakwater on the west side approximately 2,396 feet long; an entrance 600 feet wide between the breakwaters; a harbor basin in the lee of the east breakwater, 35 feet deep and about 2,000 feet long, with a maximum width of 1,450 feet. The project was completed in 1931. Total Federal cost of the project to date for new work is $1,778,560 and for maintenance $2,377,697, totaling $4,156,257.

Kahului is the only deep-water port on the island of Maui. Mainland and foreign imports for 1956 totaled 154,689 tons; interisland imports were 55,540 tons. Exports for 1956 were interisland 45,343 tons; trans-Pacific 446,353 tons.

The existing turning basin in the Kahului Harbor is about 2,000 feet long and 1,450 feet wide. However, the necessity of turning at the harbor entrance together with the strong winds which prevail a large part of the time make berthing extremely hazardous especially for the larger vessels.

The proposed additional enlargement would provide about 700 feet additional width along the west side of the existing harbor basin. Subsurface investigations have been recently completed. Preliminary estimate of the first cost of the project is $940,000. Average annual benefits which will accrue to the proposed project are estimated at $60,000.

The harbor inspection trip enabled the members of the committee to make first-hand observations with respect to the need for the basin improvements desired by local interests.

KAUNAKAKAI HARBOR, MOLOKAI

The existing Kaunakakai Harbor project provides a basin 600 feet wide, 23 feet deep, and about 1,500 feet long. The project was completed in 1934. The Kaunakakai Harbor, which will accommodate only shallow-draft vessels and barges, is the only port on the island of Molokai. Interisland imports for 1956 totaled 45,339 tons; exports

for the same year were 217,037 tons. No trans-Pacific shipments were made from Kaunakakai Harbor. Federal cost of the project to date is $165,063 of which $61,863 has been for maintenance.

Local interests advised the committee members that further improvement of the harbor to accommodate larger vessels would greatly advance the island's economic interests. Because of the present harbor depth all trans-Pacific imports and exports must be transferred to barges or lighters for loading and unloading. Studies have been authorized to determine the most desirable method of improvement to meet these commercial needs. The survey will be initiated when funds are made available to the Civil Works Division of the Corps of Engineers.

KALAUPAPA LANDING, MOLOKAI

The settlement of Kalaupapa on the island of Molokai was established for treatment for those suffering from Hansen's disease and now has a population of about 150. The area is inaccessible from the rest of the island except by footpath. Supplies are presently either flown in or brought in by canoes or outboard motorboats from barges anchored off shore.

It is proposed to provide a barge landing for the community. A study has been authorized to determine whether the improvement should be made.

NAWILIWILI HARBOR, KAUAI

The existing project in Nawiliwili Harbor, now completed, provides for a rubble-mound breakwater about 2,150 feet in length; an entrance channel 40 feet deep with a minimum width of 600 feet and a length of about 2,400 feet; a harbor basin 35 feet deep with a maximum width of 1,540 feet and a maximum length of 1,950 feet, and a revetted fill on the west side of the harbor. Nawiliwili Harbor is one of two deep-water harbors on the island of Kauai, the other being Port Allen. Trans-Pacific imports to Nawiliwili for 1956 totaled 60,537 tons; interisland imports were 37,784 tons. Exports for 1956 were trans-Pacific, 318,262 tons; interisland, 15,784 tons.

PORT ALLEN HARBOR, KAUAI

The existing project for Port Allen Harbor, completed in 1948, provides for a rubble-mound breakwater about 1,200 feet long on the east side of the bay; an entrance channel 500 feet wide and 35 feet deep; and a harbor basin about 1,200 feet wide, 1,000 feet long and 35 feet deep. The total Federal cost for new work on Port Allen Harbor to date is $752,645, and for maintenance is $118,838. Contributed funds for new work total $200,000.

Value of Harbor Trips

Trans-Pacific imports for 1956 totaled 63,689 tons, and interisland imports were 19,647 tons. The exports for 1956 were trans-Pacific 45,657 tons, interisland 5,589 tons.

Whenever possible the committee took boat trips in the harbors in order to observe navigation difficulties and be advised by local interests

and the civil-works officers of the Corps of Engineers as to the work they deemed necessary to improve navigation. These harbor trips also enabled the committee members to take "on the spot" notes of the types and volume of commerce using the particular harbor and to acquaint themselves with the extent and type of port facilities provided by local port authorities and shipping interests to utilize the harbor. These are factors taken into account by the committee members when they consider the advisability of investing the taxpayers' money in harbor and navigation improvements.

Flood-Control Projects

KAWAINUI SWAMP, OAHU

The approved Kawainui Swamp project provides for an unlined tidewater flood channel 9,465 feet long, 80 to 110 feet bottom width, and 10 to 14 feet deep; and a reinforced concrete control structure 262 feet long at the inlet to the channel; and a levee along the existing drainage canal west of the town of Kailua.

Kailua is located on a large barrier beach which extends about 2 miles along the shoreline and about 1 mile inland to the Kawainui swamp. Much of the area is subject to flooding from the swamp, the worst of record occurring in March 1951. Damages from this flood were estimated at $190,630. Shortly thereafter the Territory of Hawaii constructed the Oneawa Channel, which partially alleviates the flood threat; however, a flood of the magnitude of that of 1951 would do considerable damage. The Corps of Engineers advises the committee that this proposed project for Kawainui Swamp would afford complete protection. The average annual flood control benefits are estimated to be $196,000. The estimated Federal cost of the proposed project is $935,000. Members of the committee went over the area involved.

PALOLO AND MANOA STREAMS, OAHU

Palolo and Manoa streams with their confluence about 2 miles from the Pacic Ocean flow through the city of Honolulu. Valley lands have been developed considerably during the past several years. Flash floods caused by heavy runoff from the mountain areas have caused considerable damage. Investigations and studies are being made to determine the most feasible plan of improvement to be recommended for approval by the Committee on Public Works.

WAILOA STREAM, HAWAII

The Wailoa Stream and its tributaries flood-control project has been approved by Congress and it provides for the construction of a compacted earth diversion dike 335 feet long, 12 feet high, with a top width of 10 feet, and an unlined channel 230 feet long with a bottom width of 40 feet, to combine the flows of the Kawili and Waiakea Streams above the city of Hilo; improvements of the present Waiakea channel embankments to contain the combined flows within the channel at certain low points between the point of diversion and the residential area; and construction of a new channel 20 feet wide

and 2,590 feet long, short reaches of which would be grouted with rocks, for Waiakea Stream from the sinkholes just above Kinoole Street to Waiakea Pond with necessary flanking levees for 10 feet top width along the lower portion of its length.

The existing channel of the Wailoa Stream through Hilo is adequate to handle the flow from only relatively minor rainstorms. Consequently, flood damages are frequent in the areas adjacent to the stream. Average annual damages were estimated at over $12,000 in 1949, and would probably be more under the present state of development. Federal cost of the authorized improvement is estimated at $270,000.

IAO STREAM, WAILUKI, MAUI

The flash nature of flooding on the Iao Stream has in the past inflicted severe damage and caused the loss of many lives in the Wailuku area. The upper reaches of Iao Stream in the vicinity of Wailuku were improved by the Territorial government. However, sufficient local funds were not available to complete the work to provide the full degree of protection necessary. A Federal project was initiated as an emergency measure to clear and improve the channel below the Territorial project and this project was completed in 1956.

Preliminary studies reveal the extent that floods on this stream have caused loss of life and property damage of considerable magnitude and frequency in the stream area and indicate jutsification for protective measures against floods. Estimated annual flood damages are $34,600.

KAUNAKAKAI STREAM, MOLOKAI

The existing project, completed in 1950, provides for an enlarged stream channel flanked by earth levees with rock facing on the streamside slope. The left bank levee extends for a distance of 3,520 feet from the bluff adjacent to the stream and north of the town of Kaunakakai to the Pacific Ocean. The right bank levee extends for a distance of 1,050 feet downstream from the opposite bluff past the Kaunakakai Homesteads. Kaunakakai is located on the south central shore of Molokai and is the principal industrial and commercial town of the island, and prior to the construction of the flood-control works, was subject to flooding. Damages ranged from $5,000 to $130,000 for each flood. The Corps of Engineers advised the members of the committee that several floods of damaging proportions which have occurred since the completion of the project have been completely controlled. Average annual tangible benefits are estimated at $6,200. Federal cost of the project was $73,748.

WAILUA RIVER, KAUAI

The Wailua River has caused considerable flood damage in recent years to the town of Wailua. The flash nature of floods in the area precludes any organized flood-fighting operations. Investigations and studies are being made on the various aspects of the flood problems to determine the most feasible and economically justified plan of improvement.

WAIMEA RIVER, KAUAI

The Waimea River has caused serious damages to the town of Waimea and the adjoining valley. Heavy damages have been caused in recent years by floods of large magnitude. A levee was completed by the Territory of Hawaii terminating at about 1,200 feet upstream from the river mouth. However, the town of Waimea is still vulnerable to overflow in the section downstream from the levee.

Various methods of improving the river for flood control were investigated. Those considered included construction of a reservoir, channel improvement, construction of floodwalls, raising and extending the existing levee, and protection of the left bank. Consideration is being given to extending the existing levee to the sea.

Revision of a report previously submitted to the Congress has recently been completed, and will be available in the near future. Estimated Federal cost of the improvement is $410,000. Average annual benefits are estimated at $19,800.

HANAPEPE RIVER, KAUAI

The approved project for the Hanapepe River provides for the construction of a 370-foot earth levee extending upstream along the east bank of the river from the new Kauai Belt Highway Bridge about one-half mile above the river mouth, and a 1,720-foot reinforced concrete floodwall extending from the earth dike along the southeast bank to the cliffs at the northeast corner of the town of Hanapepe.

Hanapepe is located along both sides of the Hanapepe River about one-half mile upstream from its mouth. The project under study would provide protection for the population of about 1,500 as well as for the commercial and business center of the large surrounding agricultural area. Floods in the town have a direct disrupting effect on the economy of the surrounding area and indirectly affect the economy of the entire island. Serious injury and loss of life as well as extensive damage to property are threats because of the flash nature of the floods. Flood damages to Hanapepe of $40,000 to $50,000 per storm are not uncommon. Average flood damages are estimated at $23,000 annually. The estimated Federal cost of the project is $445,000.

Beach Erosion Projects

WAIKIKI BEACH, OAHU

Waikiki Beach is one of the most famous beaches in the world and a substantial factor in the development of the very profitable tourist program in Hawaii. As a consequence the protection of this beach is of the utmost importance.

The authorized project provides for the protection and improvement of the publicly owned portions of the shores of Waikiki Beach from the War Memorial Natatorium to the southeast boundary of Fort DeRussy. These measures consist of the artificial placement of suitable sandfill on the shore to widen the beach berm to widths of 75 to 150 feet; the construction of 1,200 feet of terrace wall, 2 groins, and appurtenant drainage facilities. The construction of the groins and approximate 800 feet of wall was originally deferred pend-

ing demonstration of their need. Construction of one of the groins originally deferred was approved in January 1957.

The second phase of improvement by the Territory of Hawaii is nearing completion. Federal authorization of the project provides for the contribution of Federal funds in an amount equal to one-third of the first cost of the measures for the protection and improvement of the publicly owned portions of the beach.

Territorial expenditures to date have been over $950,000. No Federal funds have been contributed.

WAIMEA AND HANAPEPE BEACH, KAUAI

A Federal-Territorial cooperative study with respect to the protection of the Waimea-Hanapepe Beach is in progress and it is presently estimated that the Federal cost of improvements will be $20,000.

SMALL-BOAT HARBORS

Relatively few harbors for small boats and light-draft vessels have been developed in the Hawaiian Islands. Local interests point out that such harbors would be of great benefit for recreational and fishing purposes and as harbors of refuge. Work on preliminary studies were started by the Corps of Engineers in 1951. About 20 sites have been proposed by local interests, among them being—

Oahu: Waialua, Pokai Bay, Honolulu, Maunalua, and Kailua.
Hawaii: Waipio, Hilo (Reeds Bay), Pohoiki, South Point, and Keahou.
Maui: Keanae, Hana, Nuu, and LaHaina.
Molokai: West Molokai, Kalaupapa, and Pukoo.
Kauai: Waimea, Kukuiula, Hanalei, and Nualolo.

Public Buildings in Hawaii

One of the public buildings inspected by the committee was that at Wailuku, Maui. The building is in a sad state of repair. Termites and dry rot have wrought a destruction to the interior and the appearance is one of shameful neglect. The post office in Wailuku is much too small for current requirements and the committee feels that special consideration should be given to the construction of an adequate Federal building on land already owned by the Federal Government.

Highways in Hawaii

Highway conditions on the islands of Oahu, Hawaii, Maui, Molokai, and Kauai were observed by the committee members as they traveled en route to the inspection of harbors and flood-control projects of these islands. Interisland travel was via airlines.

None of the islands has an adequate mileage of improved highways for current demands of commercial, military, and tourist travel. The nearest approach to adequacy in this respect is the island of Oahu and the modern city of Honolulu and United States Army, Air Force, and Navy installations on this island account for a concentration of highway work on Oahu. However, the committee members were informed that considerations of national defense should result in an expanded program of highway construction on the island.

On "the Big Island" Hawaii, the committee members traveled on existing highways around the island from Hilo, through the Hawaii National Park, up the famous Kona coast with its black sands, through miles of lava flows, and finally back to Hilo via the ranch and sugarcane regions. Much of the mileage is substandard and in some instances the roadway is only wide enough for one-way travel. The committee heard testimony to the effect that highways crossing the island were greatly needed and that the provision of such highways would enable the Army and the Air Force to transfer some installations to the island to reduce the concentration of posts on Oahu.

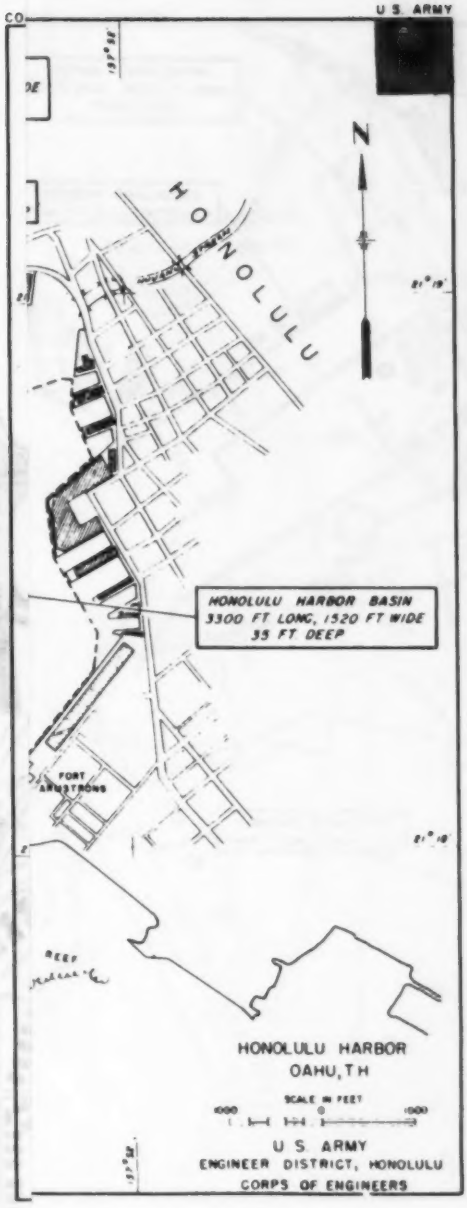
Similar highway deficiencies were noted on the islands of Maui, Molokai, and Kauai. During the course of hearings held on the various islands local interests always stressed the point that the people of Hawaii must pay the increased automotive taxes imposed by the Highway Revenue Act of 1956, approved by Congress to pay the cost of an expanded system of Federal-aid highways and the completion of our 41,000 mile system of interstate highways. At the same time they always, and correctly, pointed out that the Hawaiian Islands are not included in the 41,000-mile Interstate Highway program. To remedy this situation local interests strongly urged amendment of the Federal Aid Highway Act of 1956 to give the Hawaiian Islands their proportionate share of available trust funds for the construction of necessary defense highways. A suggestion came from a number of sources that some of the highway money could be used to subsidize the operation of interisland ferries to supplement existing airlines and thereby facilitate tourist and general commercial transportation between the islands. Tourism is one of Hawaii's leading sources of income.

Because of climatic conditions, substance of the terrain, availability of construction material, and other factors, roadbuilding in most areas of the various islands is less expensive than on the mainland. Tunnel work, of course, such as the new tunnel through the Pali Pass, is an expensive operation. In this case the cost of the Pali Tunnel was $9 million. Local interests point out that a program permitting a 90–10 percent ratio for the Hawaiian Islands would give substantial impetus to roadbuilding in the islands.

After hearing testimony on the highway program, some members of the committee expressed support for the idea of using highway funds to subsidize a ferry system operated from island to island by the Territorial highway department for the movement of tourists traveling by car and the movement of agricultural produce.

In the inspection of highways the committee had the able assistance of Mr. William C. Wachter, superintendent of public works and chief highway engineer for the Territory of Hawaii, and members of his staff; also representatives of the bureau of public roads.

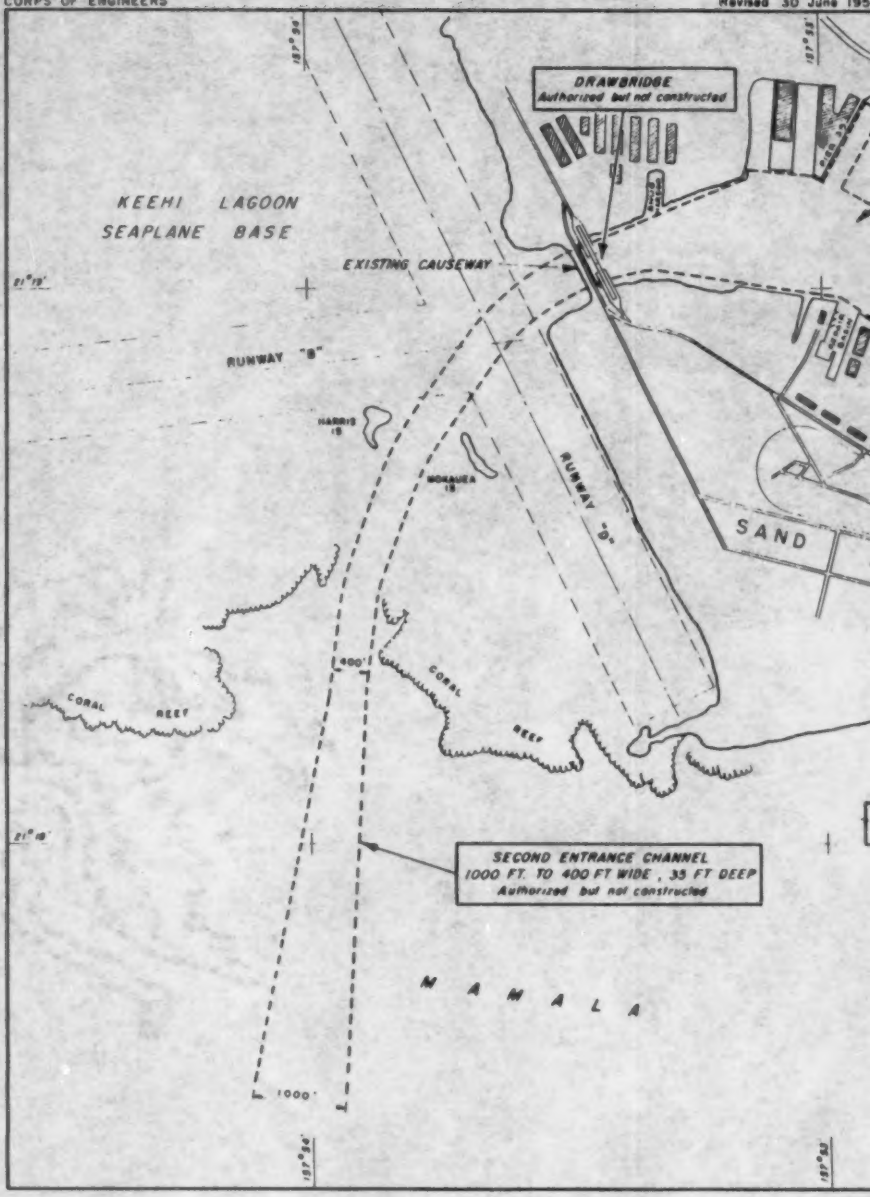
Mr. Wachter gave the committee a detail report on the highway situation in the Hawaiian Islands and this may be found in the hearings on Public Works Projects in Hawaii. The committee was impressed by the content and scope of Mr. Wachter's statement and it gave the members a comprehensive outline of the highway problems involved.

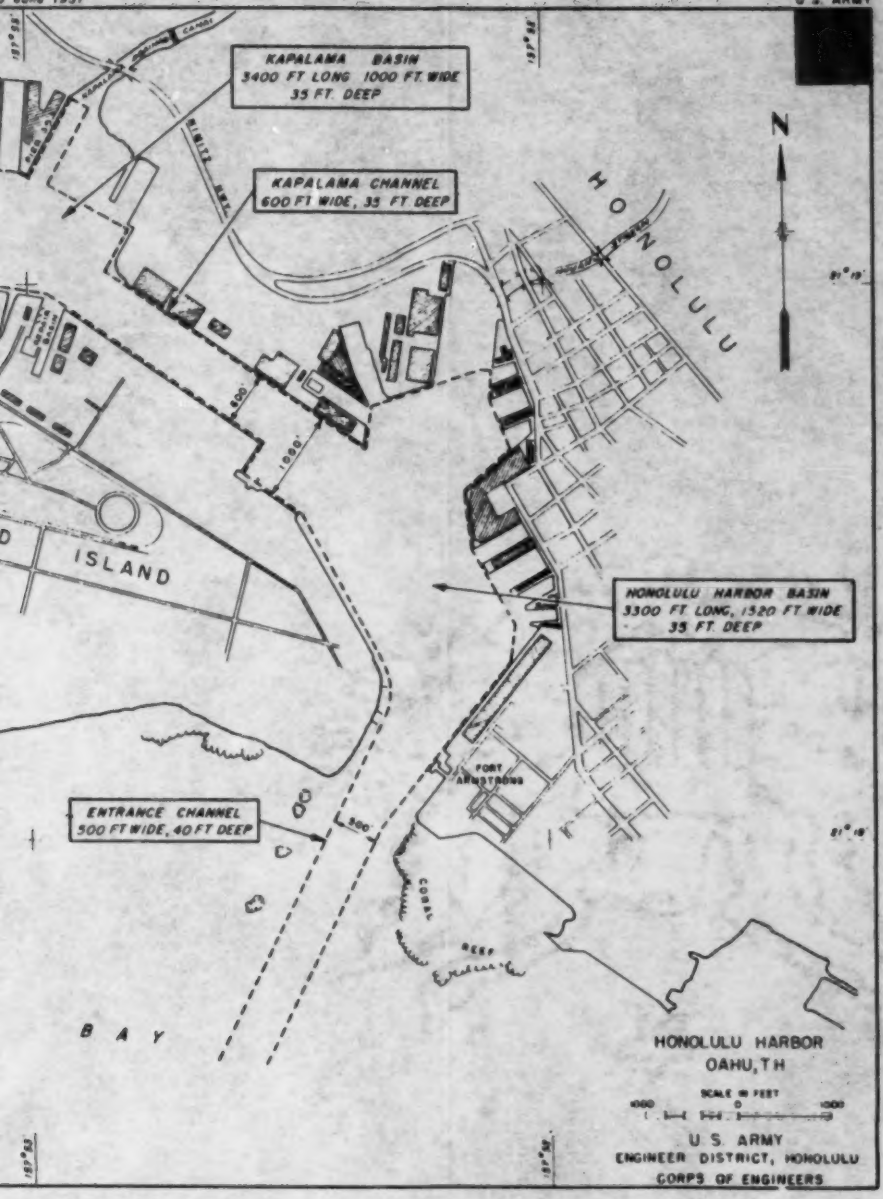


21237 O-58 (Face p. 12) No. 1

CORPS OF ENGINEERS

Revised 30 June 195

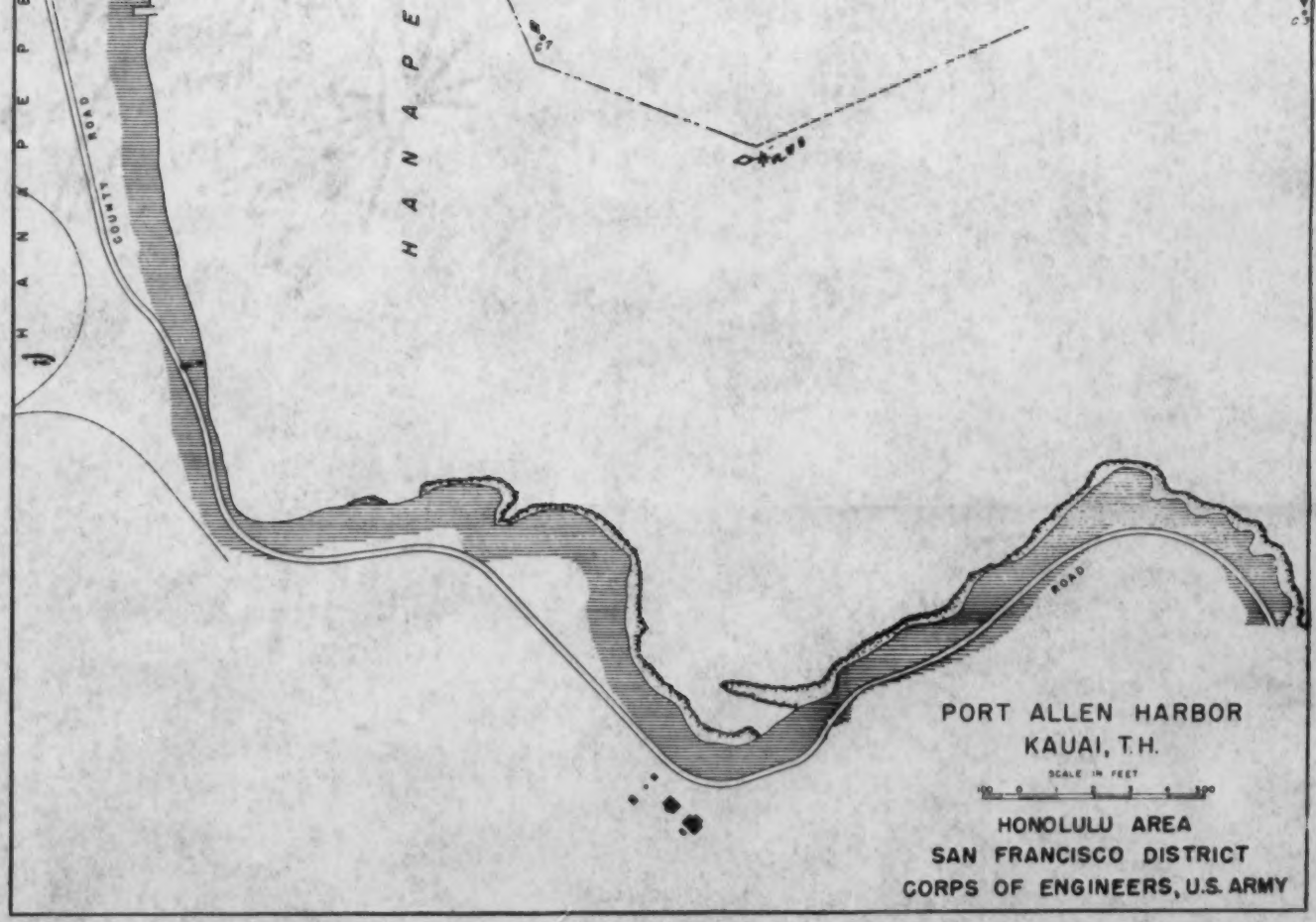




21237 O - 58 (Face p. 12) No. 1

CORPS OF ENGINEERS

U. S. ARMY

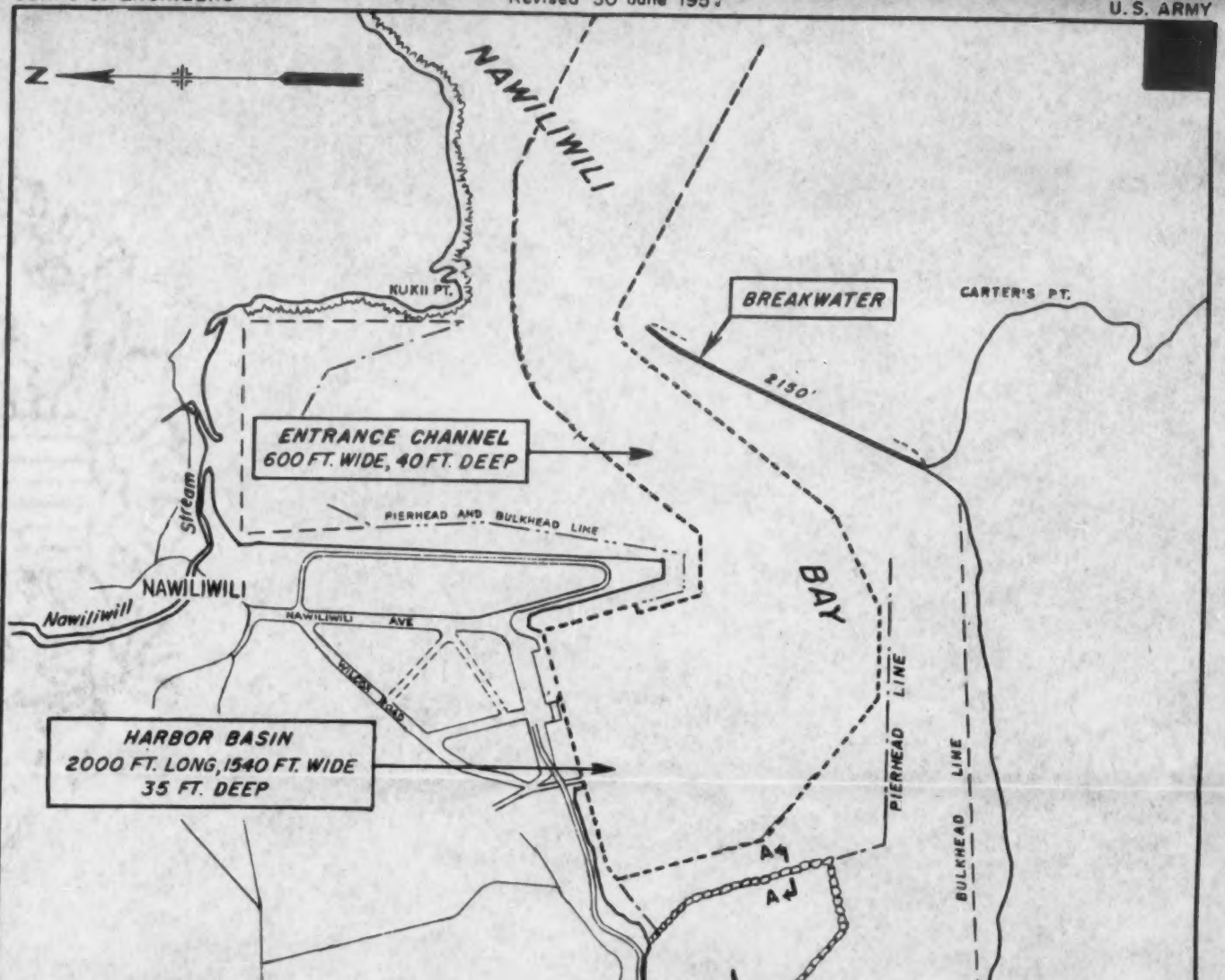


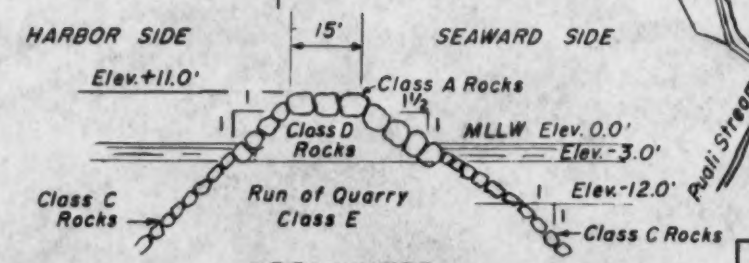
21237 O - 58 (Face p. 12) No. 2

CORPS OF ENGINEERS

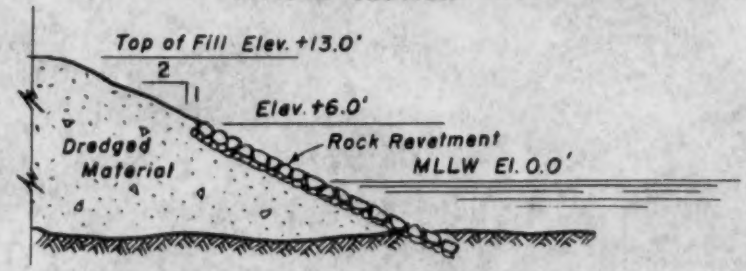
Revised 30 June 1957

U.S. ARMY

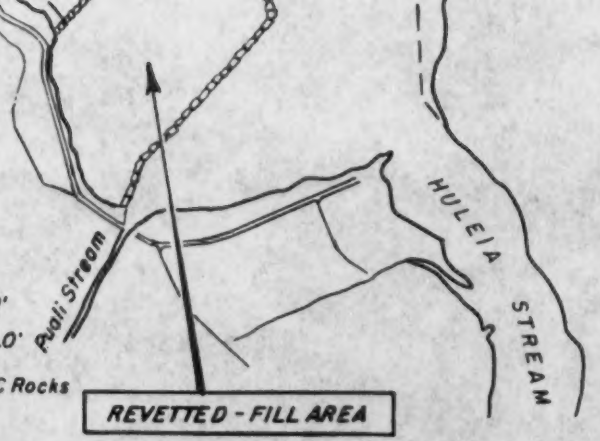




BREAKWATER
TYPICAL SECTION



SECTION A-A
REVETTED-FILL AREA



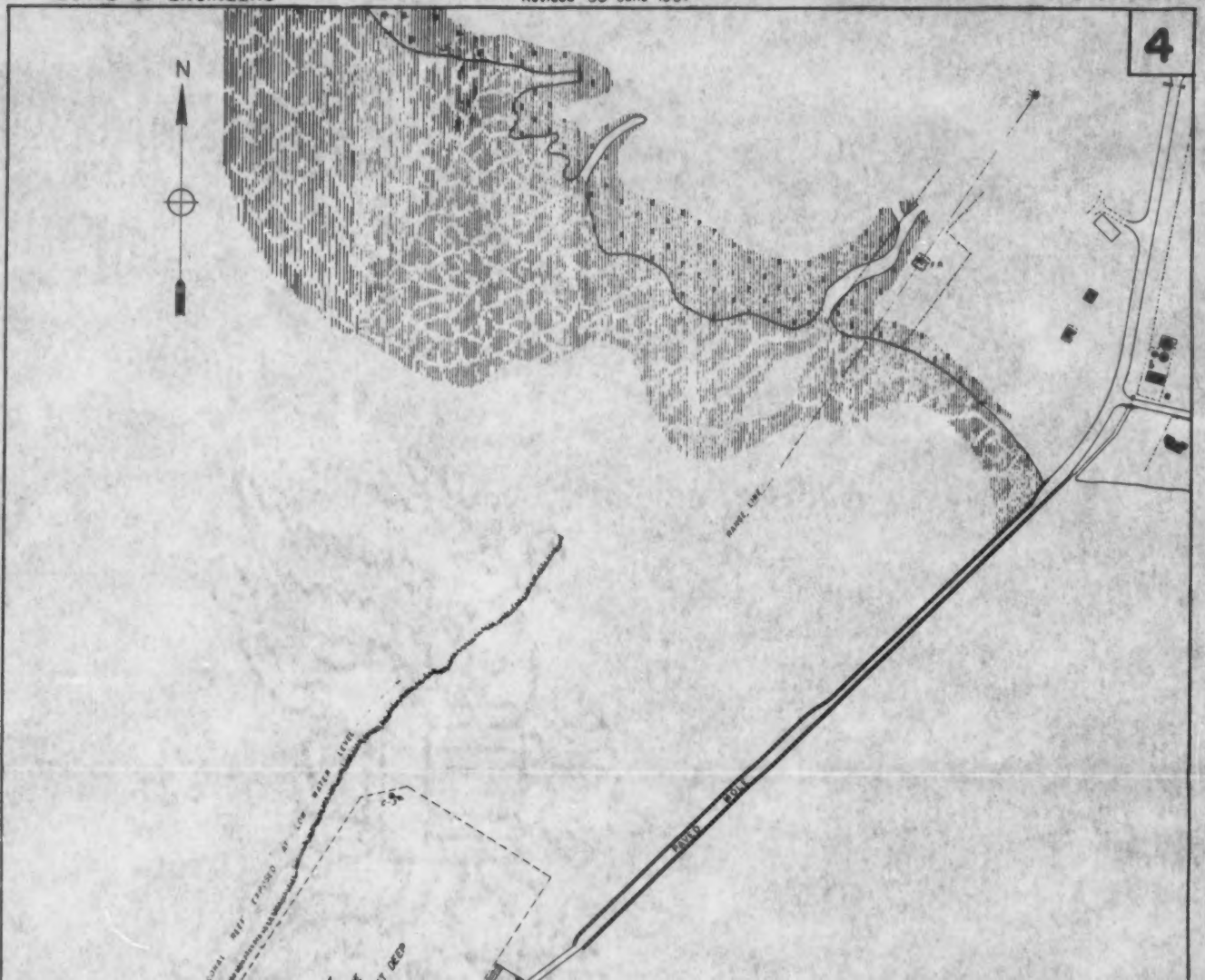
NAWILIWILI HARBOR
KAUAI, T.H.

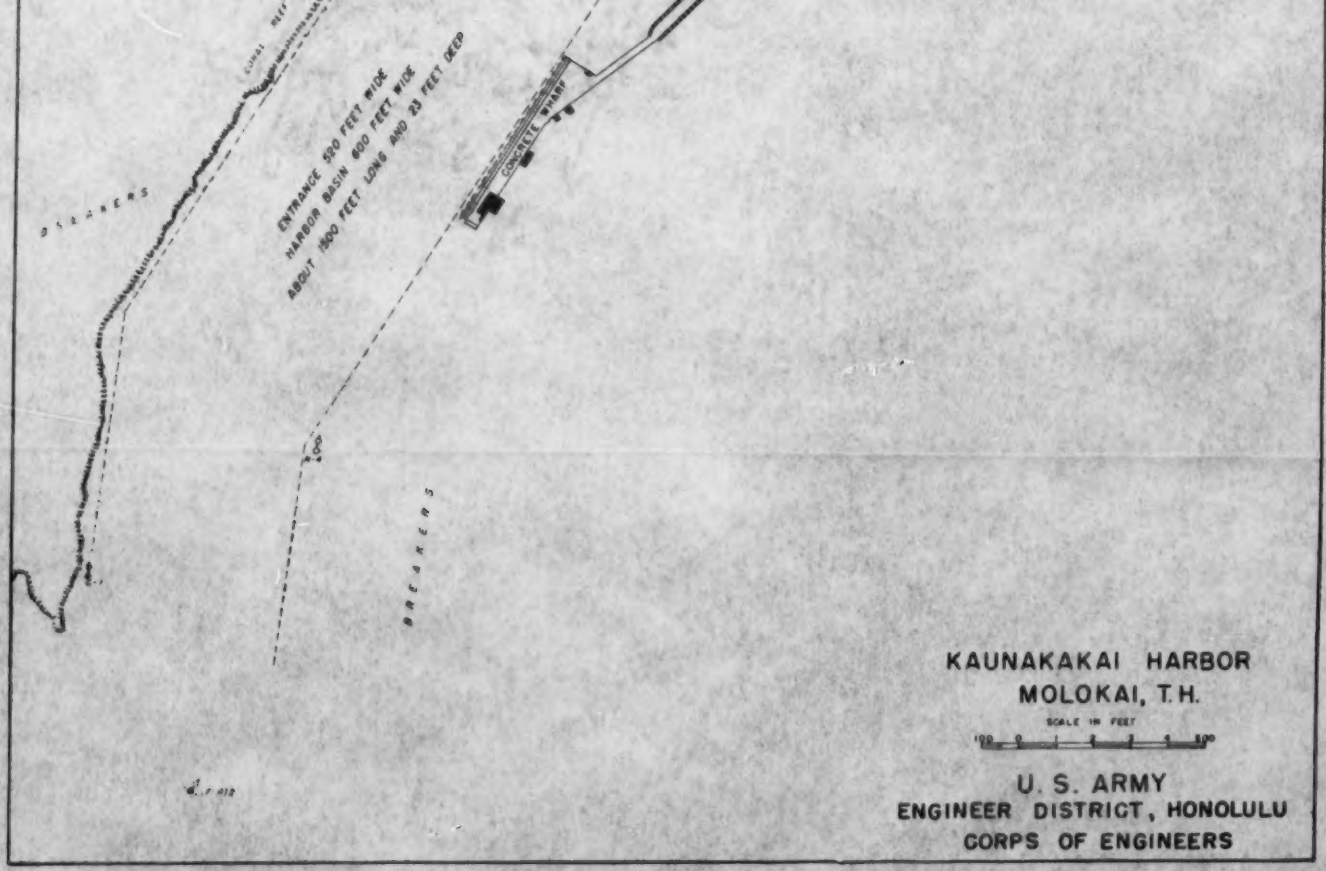
SCALE IN FEET
500 0 500 1000

U. S. ARMY
ENGINEER DISTRICT, HONOLULU
CORPS OF ENGINEERS

21237 O - 58 (Face p. 12) No. 3

CORPS OF ENGINEERS Revised 30 June 1957 U. S. ARMY





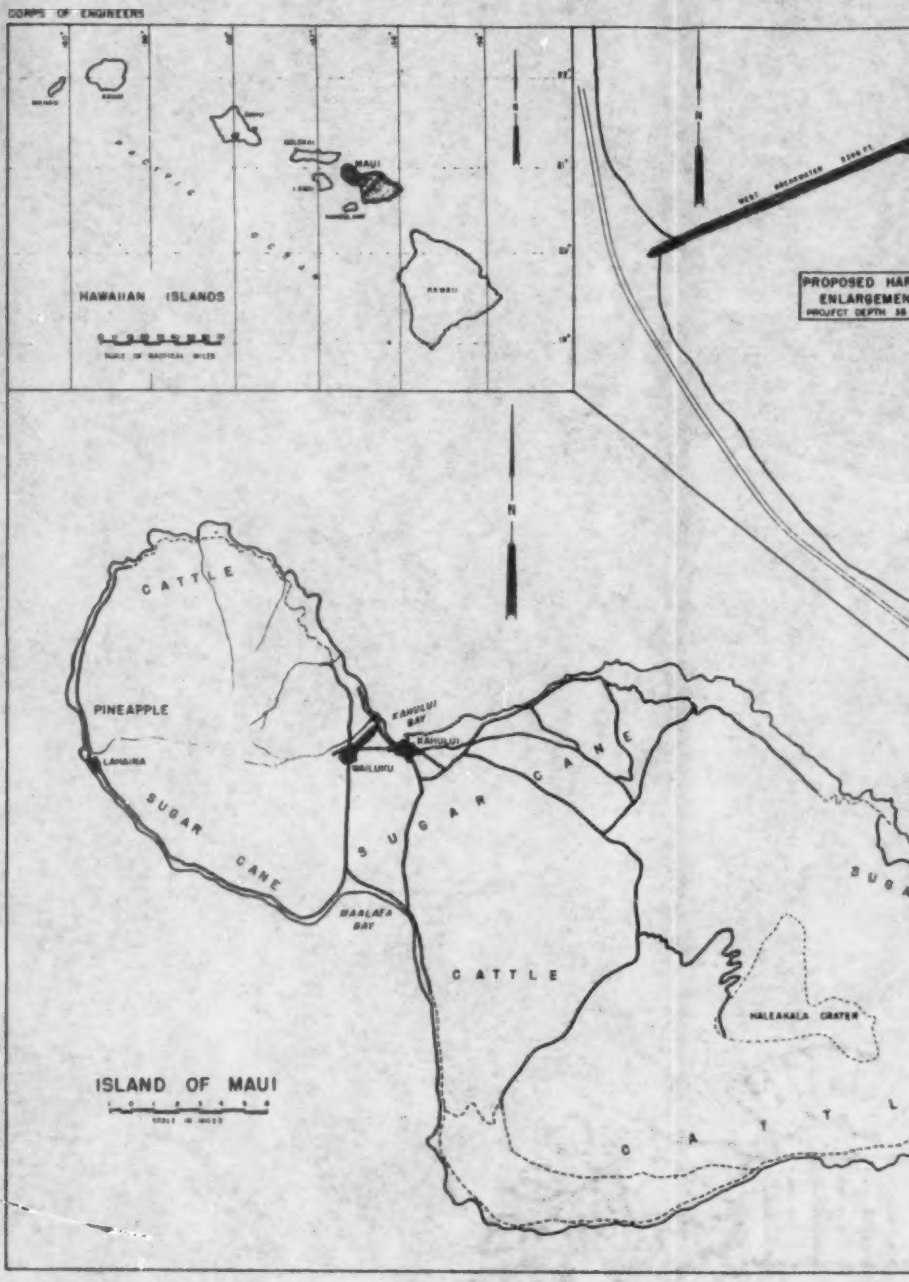
KAUNAKAKAI HARBOR
MOLOKAI, T.H.

SCALE IN FEET

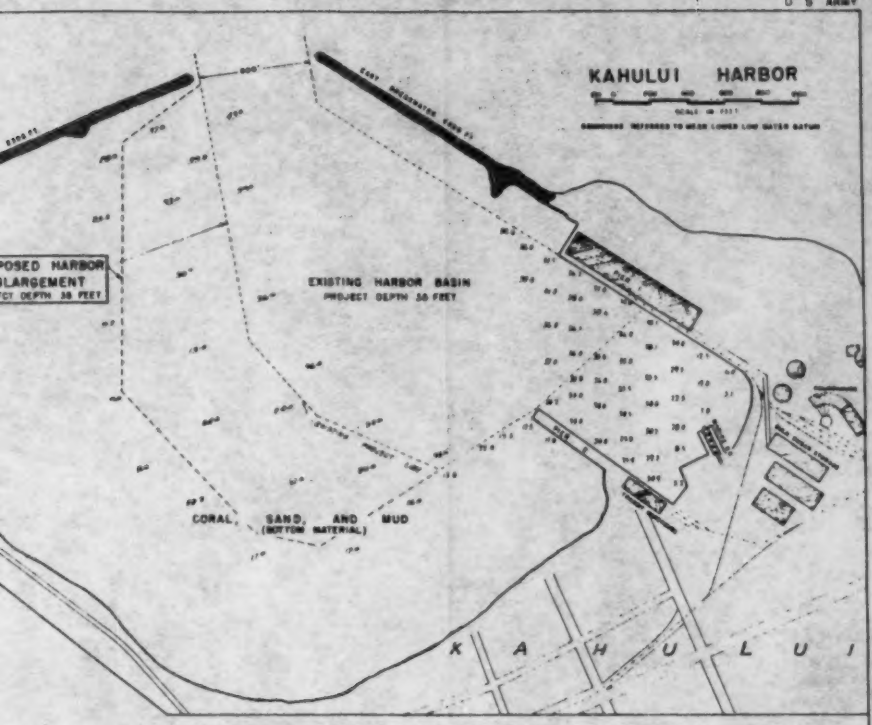
100 0 100 200 300 400

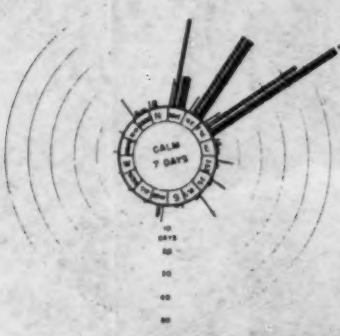
U. S. ARMY
ENGINEER DISTRICT, HONOLULU
CORPS OF ENGINEERS

21237 O - 58 (Face p. 12) No. 4


CORPS OF ENGINEERS
HAWAIIAN ISLANDS
MAUI
HAWAII
PACIFIC
OCEAN
PROPOSED HAR
ENLARGEMEN
PROJECT DEPTH 36
WEST BREAKWATER 5300 FT
N
CATTLE
PINEAPPLE
LAHAINA
KAHULUI BAY
KAHULUI
WAILUKU
SUGAR CANE
MAALAEA BAY
HALEAKALA CRATER
ISLAND OF MAUI

U S ARMY





WIND DIAGRAM

DATA FROM
U S WEATHER BUREAU,
KAHULUI AIRPORT

PRELIMINARY EXAMINATION
KAHULUI HARBOR
MAUI, T. H.
GENERAL MAP

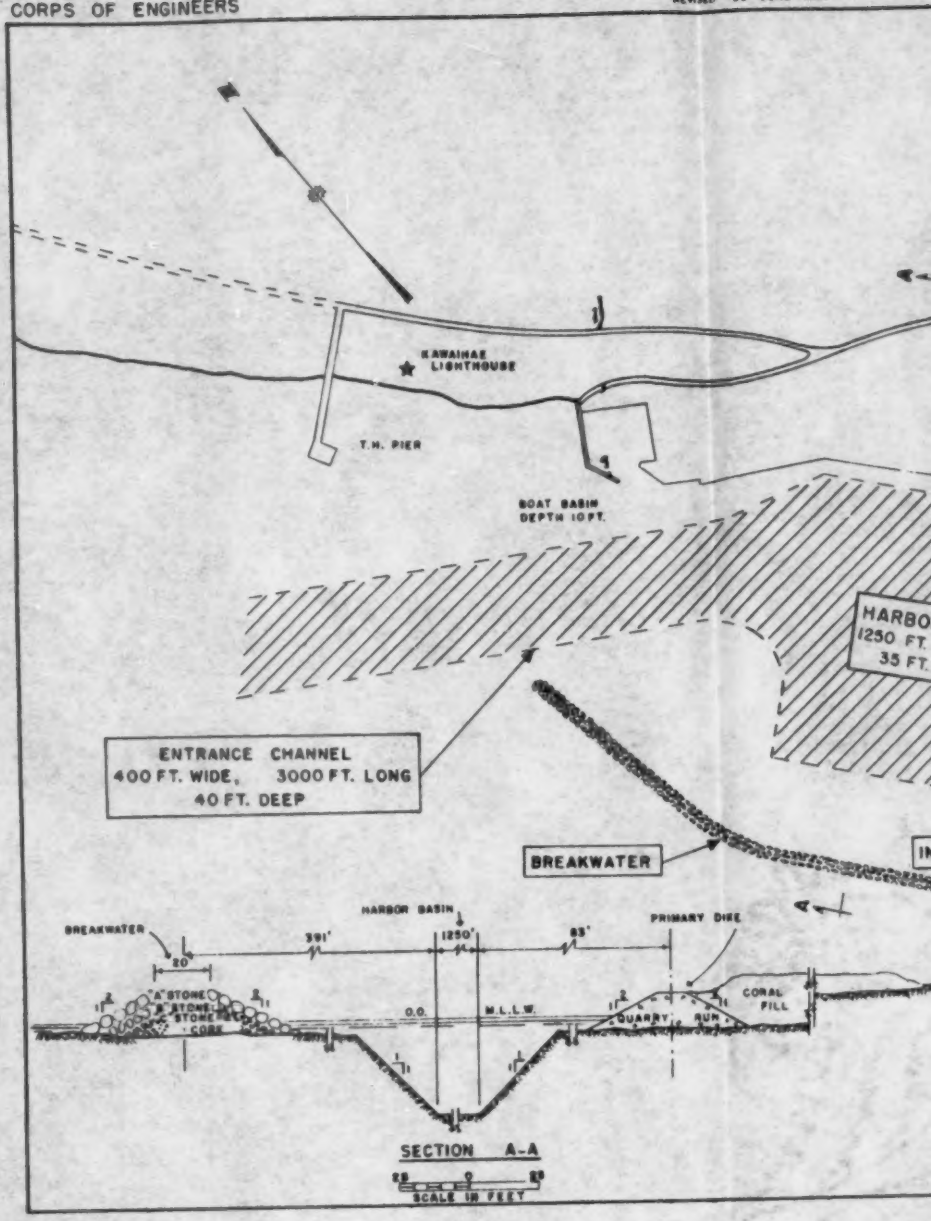
RH-570

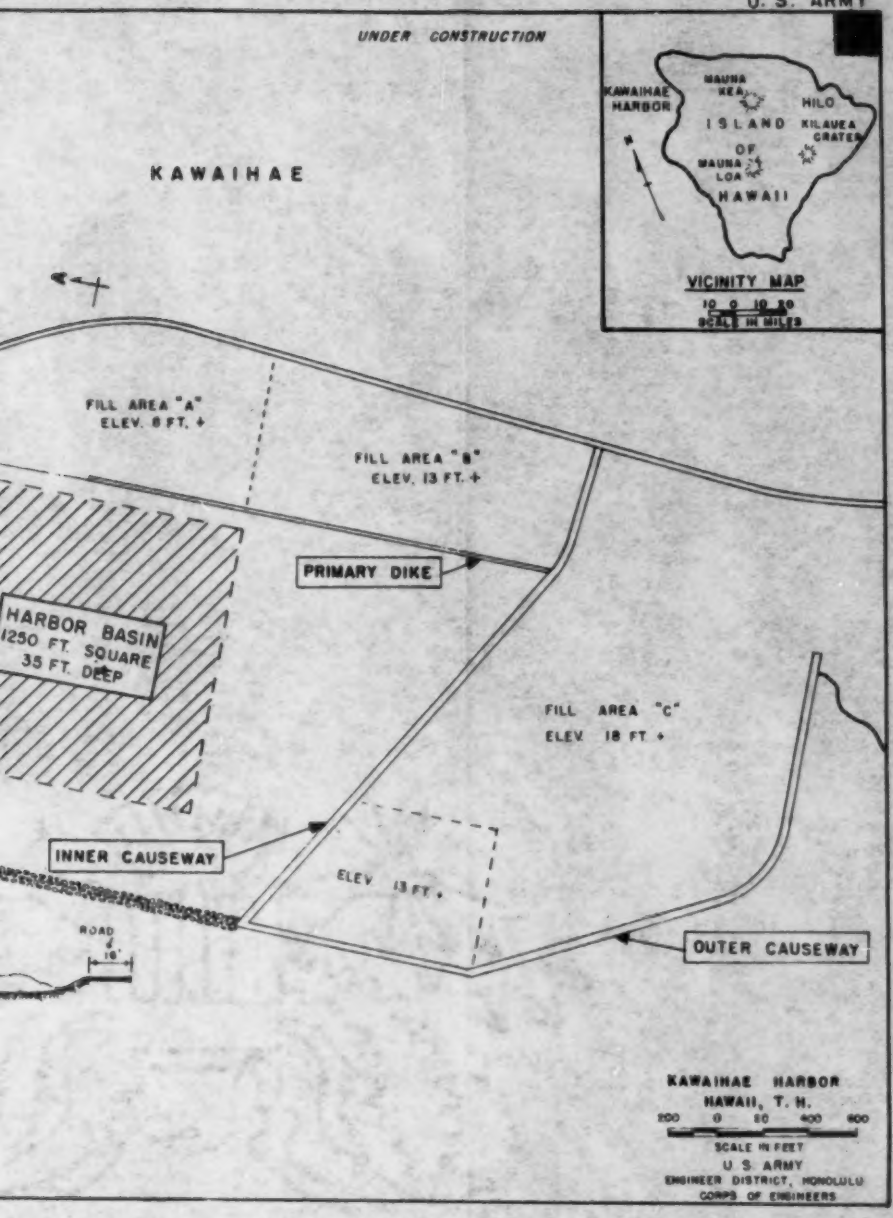
PLATE 1

21237 O-58 (Face p. 12) No. 5

CORPS OF ENGINEERS

REVISED 30 JUNE 1957

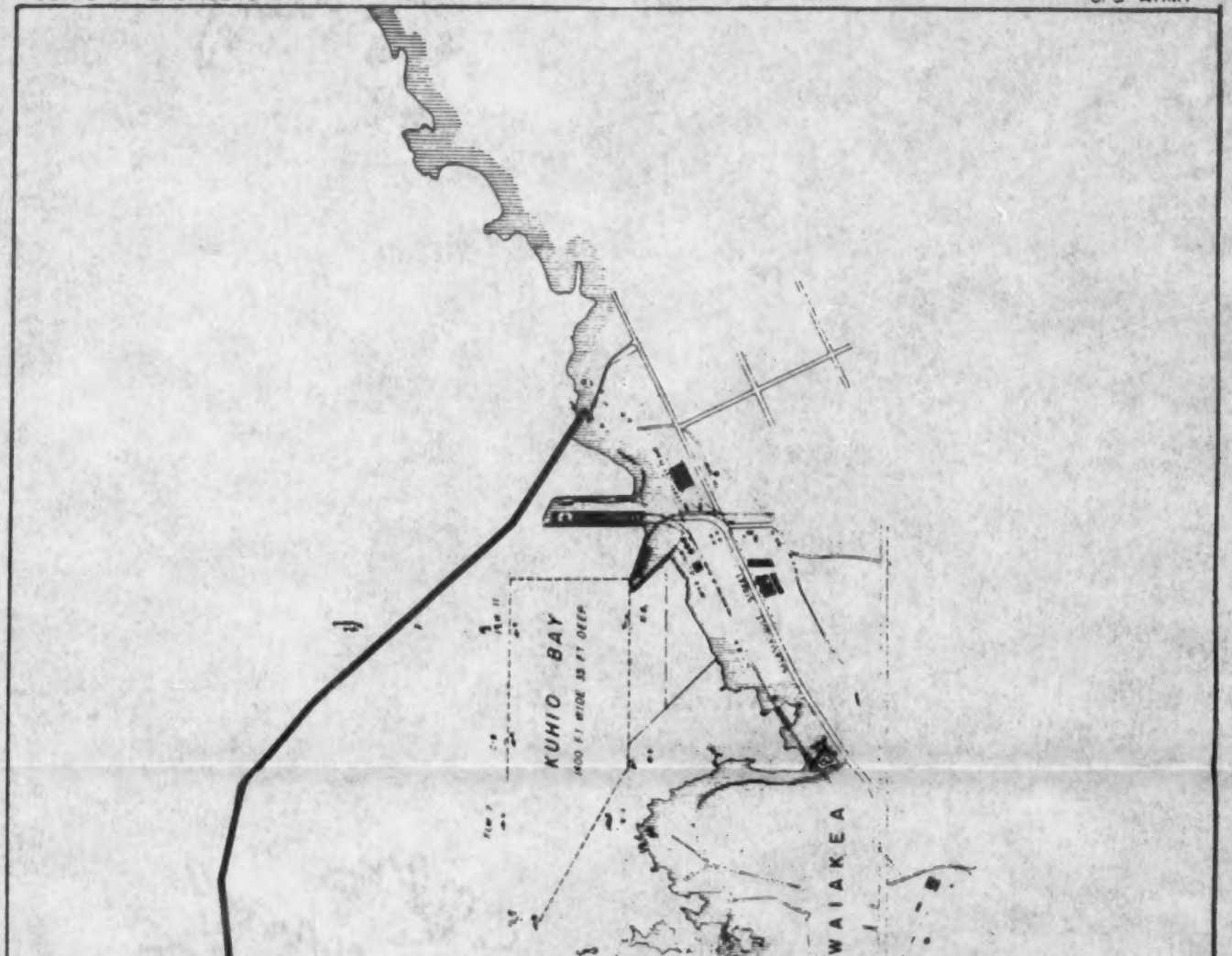




212377 O-58 (Face p. 12) No. 6

CORPS OF ENGINEERS

U. S ARMY



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SEAWALL

Summary Comments on Hawaii

The members of the Inspection Committee are in general accord on these points with respect to matters within the jurisdiction of the Committee on Public Works:

(1) Commercial harbors of the various islands should be given a high priority because of the islands' main dependence on transoceanic commerce.

(2) Participation by Hawaii to a greater extent in highway funds to bring the islands' road system to meet current and prospective needs.

(3) Authorize necessary improvement of inadequate public buildings at the earliest possible date, especially when existing quarters are in dangerous state of repair and insufficient in space to meet government requirements.

(4) Developments that will facilitate interisland tourist travel and serve to attract travel to the islands.

No comment is made with respect to statehood for Hawaii since this is a legislative matter not within the jurisdiction of the Committee on Public Works.

Through the various hearings held and the extensive inspections made the committee members obtained a comprehensive understanding of the Hawaiian Islands and the problems of the Territory of Hawaii.

In arranging for these hearings and in planning the various inspection trips the committee was assisted by Brig. Gen. Ellsworth I. Davis, division engineer, Pacific division, and Lt. Col. McGlachlin Hatch, Honolulu district engineer, and members of their respective staffs. This coordination enabled the committee to crowd into the limited time available more in the way of hearings and inspection trips than would normally have been possible.

21237—58——2

ILLINOIS ROAD TEST

Some members of the committee, prior to their trip to Hawaii, participated in an inspection of the work of the Illinois road test. This project, which is being conducted near Ottawa, Ill., is sponsored by the American Association of State Highway Officials (AASHO) and financed by the States and the District of Columbia, the Territories of Hawaii and Puerto Rico, the Bureau of Public Roads, the Automobile Manufacturers Association, and the American Petroleum Institute, with the cooperation and assistance of the Department of Defense. The test is administered and directed by the Highway Research Board of the National Academy of Sciences, National Research Council, with the following objectives:

1. To determine the significant relationships between the number of repetitions of specified axle loads of different magnitude and arrangement and the performance of difference thicknesses of uniformly designed and constructed asphaltic concrete, plain portland cement concrete, and reinforced portland cement concrete surfaces on different thicknesses of bases and subbases when on a basement soil of known characteristics.
2. To determine the significant effects of specified vehicle axle loads and gross vehicle loads when applied at known frequency on bridges of known design and characteristics.
3. To make special studies dealing with such subjects as paved shoulders, base types, pavement fatigue, tire size and pressures, and heavy military vehicles, and to correlage the findings of these special studies with the results of the basic research.
4. To provide a record of the type and extent of effort and materials required to keep each of the test sections or portions thereof in a satisfactory condition until discontinued for test purposes.
5. To develop instrumentation, test procedures, data, charts, graphs, and formulas, which will reflect the capabilities of the various test sections; and which will be helpful in future highway design, in the evaluation of the load-carrying capabilities of existing highways and in determining the most promising areas for further highway research.

When the committee visited the project site, construction of the road-test segments was still in progress. When completed, six test loops will be located along an 8-mile right-of-way. Half of the pavement in these loops will be portland-cement concrete; half will be asphaltic concrete.

The 4 main loops will have 6,500-foot tangent (straight) sections designed as 4-lane divided highways. The lanes of each loop will be connected at the ends by banked turn-arounds of 200-foot radius, making 2 separate and continuous traffic lanes about 3.1 miles long.

There will be 2 smaller loops; 1 will have 4,400-foot tangents with turn-arounds of 50-foot radius, and its 2 traffic lanes will be about 1.9 miles long; the other loop will have 2,200-foot tangents with turn-arounds of 30-foot radius.

The tangent sections of the 6 loops will contain 836 separate test sections with various combinations of surface, base, and subbase thicknesses.

Ten lanes in 5 loops will be subjected to truck traffic 18 hours a day, 6 days a week for 2 years. Each lane will carry vehicles with specific axle loads and arrangements, and a system of electronic instruments will help to record the behavior of the pavements under this traffic. One loop will carry no test traffic. It will be used for strain and warping tests and to evaluate the effect of weather on the pavements.

Sixteen bridge spans at 4 locations on 2 of the main loops will also be tested.

When testing is completed, the pavements will revert to the Illinois Division of Highways, which has supervised their construction. They will be rehabilitated to become a part of the National System of Interstate and Defense Highways.

The Illinois road test is the third in a series of road tests supervised by the Highway Research Board. It is, however, by far the largest highway research project ever undertaken, and is estimated to cost about $20 million.

The present series of road tests began in 1950–51 when several Northeastern and Midwestern States banded together to sponsor a test in Maryland which was run on an existing concrete pavement.

The second test was a cooperative effort of a group of Western States. It was sponsored by the Western Association of State Highway Officials, and was run on two specially constructed test loops of asphaltic-concrete pavement near Malad, Idaho, in 1952–54.

In November 1954, after nearly 2 years of special studies, the American Association of State Highway Officials approved the Illinois road test, and in February 1955 the Highway Research Board accepted the responsibility for direction of the project. This road test is expected to have an important place in the future highway design practices of all States. In addition, under the provisions of the Federal Aid Highway Act of 1956, data from the test are desired by Congress for guidance in determining—

> the maximum desirable dimensions and weights of vehicles to be operated on the Federal-Aid Highway Systems, including the Interstate System. * * *

Data will also be used, in conjunction with data from other studies, in determining—

> an equitable distribution of the tax burden among the various classes of persons using the Federal-aid highways or otherwise deriving benefits from such highways.

The enterprise is designed to study roadbuilding from all aspects and is implemented by "project developed" new devises which will ascertain with mathematical precision the tire pull of heavy vehicles, the wear and tear caused by surface friction, the contraction and expansion of bridge supports, and so forth. These test devices have been invented by the staff of the project to obtain test results not heretofore possible.

The project will study driving-fatigue factors in collaboration with the United States Army to ascertain certain fatigue factors.

The results of the undertaking are being awaited with interest by by the Committee on Public Works and by highway officials of our own country and by those of other areas throughout the world.

The committee members were impressed by the progress already made in the test.

CALIFORNIA PROJECTS

On October 20, 1957, the committee left Chicago aboard a transcontinental train to engage in the inspection of public-works projects and highways in California, viewing en route the Feather River Canyon country and the development of hydroelectric-power plants in the river valley. Upon arrival in San Francisco the schedule of inspection work was as follows:

October 23: United States Highway No. 101, San Francisco, Coyote Dam, and Russian River projects.

October 24: United States Highway No. 40 to Carquinez Bridge, Vallejo, Benicia, and Martinez; public hearing at Martinez on California highway and related matters.

Octobers 25: Stockton, Calif; flood-control problems and island levees; and meeting at port of Stockton.

October 28: Los Angeles; study of Santa Ana and San Diego Harbor; meeting with San Diego Chamber of Commerce.

October 29: Inspection of State highways in San Diego area as far as Mexican border; inspection of United States customs and immigration buildings at San Ysidro; meeting at Tia Juana, Mexico, sponsored by the United States customs officials.

October 30: Inspection of Riverside, Colton, and San Bernardino Freeways.

October 31: Inspection of Los Angeles and Long Beach Harbors; inspection of highways en route; meetings with members of Los Angeles Metropolitan Traffic Association, Automobile Club of Southern California, Los Angeles Chamber of Commerce, Los Angeles Board of Harbor Commissions, and Metropolitan Transportation Engineering Board.

November 1: Inspection of highways en route to Paso Robles via Castaic, Ventura, and Santa Barbara; meeting at Santa Barbara with chamber of commerce.

November 2: Inspection of highways at Salinas, Monterey, and Santa Cruz; meeting at Monterey with local business executives.

Members of the committee were very much impressed with the progress being made by the California Department of Highways with respect to the construction of the regular Federal-aid system in the State and the development of a vast system of freeways as part of the 41,000-mile Interstate Highways System.

On November 4, from San Francisco, the members boarded the steamship *Matsonia* for the inspection trip to Hawaii, heretofore reported upon in detail.

The committee feels that much was accomplished by the inspection of the projects mentioned and the special knowledge gained by the members participating will be reflected in a judicious consideration of the public-works projects involved.

The overall program of the Public Works Committee pertaining to the development of our Interstate Highways System, the improve-

ment and development of harbors, the elimination and control of floods in affected areas, and the construction and maintenance of needed Federal buildings is comprehensive and well developed. It deserves the continued support of the Congress of the United States.

Impressive results of the impact of the Federal-aid Highway Act of 1956 on the economy of a given area was apparent in the State of California where freeways constructed with the aid of the 90–10 formula have given the country a substantial preview of what may be accomplished under the Federal-aid Highway Act of 1956. Areas hitherto devoid of commercial, social, and industrial development have appeared along the freeways. Needed new routes of transport have proven incentives to the building of homes and the establishment of industries.

The same pattern holds for other States. The Federal-aid Highway Act of 1956 will eventually link through the 41,000 mile Interstate Highway System virtually every capital city of our Nation and stimulate our economy. It is contemplated that our 41,000 miles of interstate highways will eventually provide transportation facilities for the swift and efficient movement of our growing traffic.

O